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PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2001-277656

(43)Date of publication of application : 09.10.2001

(51)Int.CI.

B41J 29/17

B41J 2/01

D06P 5/00

(21)Application number : 2000-093644

(71)Applicant : SEIREN CO LTD

(22)Date of filing : 30.03.2000

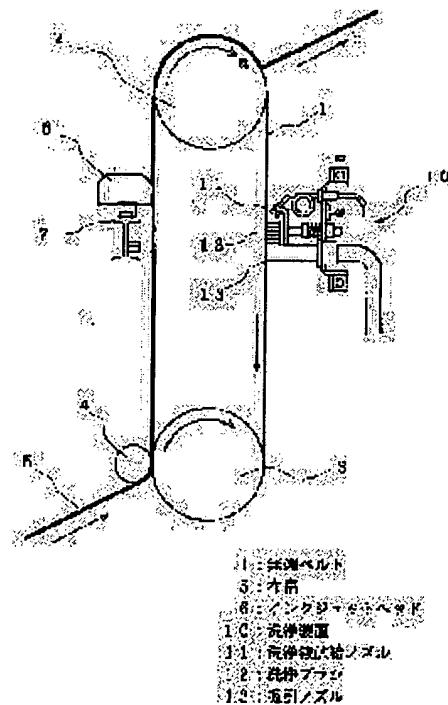
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(54) INK JET PRINTER

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a compact ink jet printer excellent in view points of cost and maintenance in which ink, naps and waste of thread adhering onto a support can be removed surely and the quality of a print product can be stabilized.

SOLUTION: The ink jet printer comprises an endless belt 1 for carrying a recording medium, i.e., a cloth 5, while supporting fixedly on the surface thereof, an ink jet head 6 for printing on the cloth 5 supported on the endless belt 1 by ejecting ink thereto, and a cleaner 10 for cleaning the surface of the endless belt 1 after the cloth 5 is stripped therefrom. The cleaner 10 comprises a cleaning brush 12 for brushing the endless belt 1 by sliding thereon in the direction orthogonal to the carrying direction thereof, a nozzle 11 for supplying cleaning liquid to the cleaning brush 12, and a suction nozzle 13 for removing residual substances, e.g. waste cleaning liquid, naps and waste of thread, standing on the endless belt 1 through suction.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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CLAIMS**[Claim(s)]**

[Claim 1] It is the ink-jet printing equipment characterized by to include an attraction means said washing means attracts a residual substance which remains to said base material in an ink-jet printing equipment equipped with a print means breathe out and print ink on a base material which carries out fixed support and conveys a record medium on a front face, and a record medium on this base material, and a washing means wash a front face of a base material after exfoliating a record medium from said base material, and remove.

[Claim 2] a direction or the direction of slant in which said washing means intersects perpendicularly to the conveyance direction of said base material -- a round trip -- an ink jet printing equipment according to claim 1 characterized by movable thing.

[Claim 3] Said washing means is an ink jet printing equipment according to claim 1 or 2 characterized by equipping a brush and this brush for washing said base material with a nozzle which supplies a penetrant remover.

[Claim 4] Said washing means is an ink jet printing equipment according to claim 1 or 2 characterized by having a nozzle which supplies a penetrant remover to a porous body and this porous body for washing said base material.

[Claim 5] Said washing means is an ink jet printing equipment according to claim 1 or 2 characterized by equipping a fiber structure object and this fiber structure object for washing said base material with a nozzle which supplies a penetrant remover.

[Claim 6] Said attraction means is an ink jet printing equipment given in any 1 of claim 1 to claims 5 characterized by being arranged in a lower part location of said washing means, and countering and arranging a point of an attraction nozzle of this attraction means in a front face of said base material.

[Claim 7] An ink jet printing equipment given in any 1 of claim 1 to claims 6 characterized by passing speed of said washing means being 10 - 100 m/sec.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] This invention relates to the ink jet printing equipment equipped with the washing station for washing the base material which supports fiber structure data medium especially about the ink jet printing equipment which breathes out ink to fiber structure data medium, and performs image formation.

[0002]

[Description of the Prior Art] As the textile-printing method to a record medium, regurgitation grant of the ink is carried out at record media, such as a fiber structure object, and the spotlight is captured today as a method with the ink jet textile-printing method effective in a multi-form smallness lot production which performs image formation. When a record medium fixes to a base material with a binder etc., and is conveyed and it comes to a position by the ink jet textile-printing method, regurgitation grant of the ink is carried out from an ink jet arm head. At this time, in the case of a textile like the thin ground or the network ground, ink will pass a textile, therefore a base material will be polluted, and a textile will be polluted further. Moreover, if a fluff, waste thread, etc. have adhered to the base material in order to give ink, where adhesion immobilization of the record media, such as a textile, is carried out at a base material, since adhesion immobilization of the textile will not be carried out in an adhesion portion at a base material, the print of a portion which changed into the condition of having floated, consequently floated becomes an ununiformity.

[0003] From such a reason, the base material washing station as shown in drawing 4 is usually formed with conventional textile-printing equipment, i.e., a screen printing machine, and a rotary print machine.

[0004] This washing station applies water to the endless belt 30 which is a textile base material by the wash water injection nozzle 31, next, by revolution of two or more washing brush rolls 32, it is dropping adhering colored glue, a fluff, waste thread, etc., then failing to write residual moisture with the rubber doctor 33, and removing residual moisture with a press roll 34 further, and washes an endless belt 30 and revives the adhesiveness of this belt 30.

[0005] On the other hand, about the ink jet printing equipment, the ink jet printing equipment which equipped JP,11-192694,A with the washing means is proposed. The conveyance section equipped with the driving means which makes the endless belt with which this performs the base material of a record medium, and conveyance, and this endless belt drive, The print section which performs the print by the ink jet arm head to the record medium conveyed with an endless belt, The stripping section which separates from an endless belt print data medium [finishing / a print] conveyed with an endless belt, and collects it from the print section, Having the washing section which washes the endless belt with which the record medium was removed in the stripping section, the washing section is an ink jet printing equipment possessing the wiping roller with which a peripheral surface consists of a macromolecule porosity object at least further.

[0006] Without making dust etc. adhere to an endless belt, since the wiping roller with which a peripheral surface consists of a macromolecule porosity object at least is provided according to the publication of said official report, the moisture which remained to the endless belt can be removed, and it is supposed that it is not necessary to exchange a wiping roller periodically.

[0007] However, since this wiping roller is rotating the macromolecule porosity object of a peripheral surface in the condition of having pushed against the endless belt and it only rubs an endless belt in the conveyance direction in a field, even if it writes, and the dropping force is weak, therefore clearance of residual liquid-like objects, such as moisture which remains to the endless belt, and ink, is possible, it is difficult to remove even the dust attached to the endless belt, and waste thread. Moreover, when a wiping roller must have the large width of face which is sufficient for covering the width of face of an endless belt and it becomes so, a diameter also becomes a considerable big thing and a large space is needed. Even when width of face is made small and a diameter also makes it small, more than one will

have to be put in order in the conveyance direction of an endless belt, and it will be necessary to take a large space in the conveyance direction. After all, in such a washing station, a lot of water is needed for washing, and in order for equipments, such as a washing brush, to become large-sized and to require a big space, a problem remains in respect of cost and a maintenance.

[0008]

[Problem(s) to be Solved by the Invention] This invention was made in order to solve the above technical problems, it is excellent in a cost side and a maintenance side, can be compact, and can ensure clearance of the ink attached on the base material, a fluff, waste thread, etc., and aims at offering the ink jet printing equipment which moreover makes quality stability of a print product possible.

[0009]

[Means for Solving the Problem] In the ink-jet printing equipment equipped with a print means to by_which an ink-jet printing equipment concerning this invention breathes out ink to a base material which carries out fixed support and conveys a record medium on a front face, and a record medium on this base material, and prints on it, and a washing means wash the front face of a base material after exfoliating a record medium from said base material, said washing means is characterized by to include an attraction means attract and remove the residual substance which remains to said base material.

[0010] Moreover, in this invention, it has the following features. a direction or the direction of slant in which said washing means intersects perpendicularly to the conveyance direction of said base material -- a round trip -- it constitutes movable.

[0011] Said washing means is considered as a configuration which equipped a brush and this brush for washing said base material with a nozzle which supplies a penetrant remover.

[0012] Said washing means is considered as a configuration equipped with a nozzle which supplies a penetrant remover to a porous body and this porous body for washing said base material.

[0013] Said washing means is considered as a configuration which equipped a fiber structure object and this fiber structure object for washing said base material with a nozzle which supplies a penetrant remover.

[0014] Said attraction means is that are arranged in the downstream of said washing means, and a point of an attraction nozzle of this attraction means is countered and arranged in a front face of said base material.

[0015] Let passing speed of said washing means preferably be the range of 10 - 100 m/sec.

[0016] Since a washing means in this invention is equipped with an attraction means, it can remove residual ink which remains to a support surface after exfoliating record media, such as a fiber structure object, and not only washing waste fluid but a fluff, waste thread, dust, etc. Moreover, since it has an attraction means, it is not necessary to carry out periodical exchange compared with a wiping mold, and ends with a small space, the need for a maintenance decreases dramatically, and since it is non-contact, deterioration of an adhesive layer of a base material cannot progress further easily, either.

[0017] moreover -- in order to make physical brushing of a support surface perform -- a washing means -- a round trip -- it constitutes movable. The migration direction is a direction or the direction of slant which intersects perpendicularly to the conveyance direction of a base material. Especially, the migration direction has a good direction which intersects perpendicularly to the conveyance direction of a base material. The reason is as follows. On the surface of a base material, an adhesive layer for making record media, such as a textile, fix is prepared, and this adhesive layer is formed using a well-known cloth-fulling agent and pressure sensitive adhesive sheets, such as water soluble resin, pressure-sensitive resin, and thermosensitive resin. And a front face of this adhesive layer will be in the condition of presenting the shape of irregularity, by repeating attachment of a up to [a base material of a record medium], and exfoliation. In order to remove liquefied matter, such as ink which entered into a concave surface of this irregularity, a washing means can wash efficiently rather than a slide to the conveyance direction of a base material like before at a penetrant remover with the more nearly little slide of a scanning direction of an ink jet arm head, and this direction (namely, cross direction of a base material). Moreover, it is because quality of a solid, such as a fluff and waste thread, can be pushed aside from a center section of the base material to an ends side by comparatively small stroke.

[0018] A porous body besides a brush and fiber structure objects, such as a textile, can also be used for a washing means like before. What is necessary is just to choose these selections suitably according to a class, washing conditions, etc. of a textile which are a record medium.

[0019] As for an attraction nozzle point of an attraction means, it is desirable that counter on the surface of a base material, and positioning is carried out to a minute gap. By adjusting minutely an attraction nozzle point of an attraction means, and a gap of a base material, an attraction wind speed of a gap portion improves, thereby, a penetrant remover becomes fog-like and attraction clearance is carried out into an attraction nozzle. As for a gap of an attraction nozzle

point and a base material, it is desirable to set it as the range of 0.2-5.0mm.

[0020] As stated above, adhesive deterioration of an adhesive layer of a support surface can be suppressed as much as possible, residual ink and a penetrant remover on a base material after record-medium exfoliation can be removed, and quality of a residual solid, such as a fluff from which residual ink, washing waste fluid, etc. are not only more removable to altitude, but the residual poses a problem most in an ink jet print by attachment of the following record medium, and waste thread, dust, can be removed. Therefore, the adhesiveness of a base material can be revived by attachment of the following record medium, and a support surface in the case of a print can be changed into a good condition.

[0021]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained using a drawing. The side elevation in which drawing 1 shows the configuration of the outline of the ink jet printing equipment of this invention, the side elevation in which drawing 2 shows a part of washing station of drawing 1 in a cross section, and drawing 3 are the front view of a washing station.

[0022] The endless belt 1 which is a textile base material is almost wound around a driving roller 2 and the follower roller 3, and rotates in the direction of an arrow head a. The adhesive layer is formed in the front face of this endless belt 1, and fixed tension is given to the endless belt 1 according to the tension device which is not illustrated.

[0023] The forcing roller 4 is formed in one straight-line migration side (outward trip side which moves perpendicularly here) of the endless belt 1 to the follower roller 3, and a textile 5 is inserted between this forcing roller 4 and the follower roller 3.

[0024] It lets out the textile 5 for printing an image from a roll (not shown), and it is inserted between the forcing roller 4 and the follower roller 3, it is forced by the fixed pressure so that Siwa etc. may not be generated with the forcing roller 4, and adhesion immobilization is carried out on the front face of the endless belt 1.

[0025] The textile 5 by which adhesion immobilization was carried out is perpendicularly conveyed by this endless belt 1 united with the endless belt 1, and ink is given to a textile 5 by the ink jet arm head 6 prepared in that suitable intermediate location. The ink jet arm head 6 is carried on the slide rail 7 so that it may move to the migration direction of a textile 5, and the horizontal direction (the direction of the front reverse side of the space of drawing 1) of a right angle, ink is given one by one to the textile 5 on the endless belt 1 by the rotation timing of scan actuation of the ink jet arm head 6, and the endless belt 1, and a necessary image is printed.

[0026] After the print of the image to a textile 5 is completed, this textile 5 goes a driving roller 2 around, exfoliates from the endless belt 1, is pulled apart in the direction of arrow head b, and is rolled round by the roll after desiccation processing (not shown).

[0027] Since the front face of the endless belt 1 after exfoliating the textile [finishing / a print] 5 has ink, a fluff, waste thread, etc. like the above-mentioned, in order to remove these, the washing station 10 is formed in the suitable location by the side of the return trip of the endless belt 1.

[0028] This washing station 10 is equipped with the penetrant remover supply nozzle 11, the washing brush 12, the attraction nozzle 13, and the drive 14 that makes the both-way migration of each of these equipments 11-13 carry out in the direction (namely, cross direction of the endless belt 1) which intersects perpendicularly in the conveyance direction of the endless belt 1 as shown in drawing 2 and drawing 3.

[0029] The penetrant remover supply nozzle 11, the washing brush 12, and the attraction nozzle 13 are supported by the washing station frame 15, and this frame 15 is supported by the bearing bar 17 prepared in the direction which intersects perpendicularly in the conveyance direction of the endless belt 1 through the up-and-down slide bearing 16 further at parallel.

[0030] It consists of a chain 18 almost wound around the chain wheel, and the drive 14 is combined with the fixing metal 19 with which each edge of a chain 18 was attached in the washing station frame 15. Therefore, a washing station 10 carries out both-way migration in an arrow head c or the direction of d by carrying out positive reverse rotation of the chain 18. Speed of this both-way migration is made into within the limits of 10 - 100 mm/sec. In addition, the timing of this both-way migration is controlled to synchronize with an intermittent revolution of the endless belt 1.

[0031] The washing brush 12 is pushed against the endless belt 1 by the predetermined pressure adjusted with the spring 20, and is performing sliding brushing to which it goes and comes back crosswise [of the endless belt 1]. The hair of a horse is used for the washing brush 12.

[0032] The penetrant remover is made to be dropped from the penetrant remover supply nozzle 11 at this washing brush 12. The water which made pure water, the detergent, and the water-soluble solvent contain is used for a penetrant remover. The amount of the penetrant remover used is quite as little as 10 - 80 cc/min, and effective. Moreover, in order to prevent air plugging of a nozzle 11, it is desirable to prepare degassing structure in operation or piping of deaeration

processing.

[0033] The attraction nozzle 13 is installed directly under the washing brush 12. Here, it has arranged and installed crosswise [of the endless belt 1 / two]. Although the gap 21 of the point of the attraction nozzle 13 and the front face of the endless belt 1 relates to attraction air capacity, a wind pressure, etc. of an aspirator (not shown), it is adjusted to the minute gap. As for this gap 21, it is desirable to set it as the range of 0.2-5.0mm. In addition, circular, a square shape, etc. are arbitration and the configuration of the attraction nozzle 13 is not limited especially.

[0034] Since the washing station 10 constituted as mentioned above carries out both-way migration crosswise [of the endless belt 1] with a chain 18, the washing brush 12 will perform repeat sliding brushing for the front face of the endless belt 1 after exfoliation of a textile 5. For this reason, residual substances, such as ink which the front face of the endless belt 1 has, and a fluff, waste thread, are raked out physically, and the attraction nozzle 13 currently further installed in the lower part location of the washing brush 12 attracts and removes these residual substances with a penetrant remover. For this reason, there is also little amount of the penetrant remover used, and it ends. Therefore, according to this washing station 10, it is removable to quality of a residual solid, such as not only liquefied matter, such as residual ink and colored glue, but a fluff from which that residual poses a problem in an ink jet print, and waste thread, dust.

[0035] Moreover, this washing station 10 is small, and since it can constitute in a compact, it can be installed in a small space. Furthermore, the endurance of the washing brush 12 and the attraction nozzle 13 is dramatically high, and since there is very little need for exchange, its maintenance nature improves far.

[0036] In the washing station 10 of this invention, the washing brush 12 and the attraction nozzle 13 carry out both-way migration like the above-mentioned in the conveyance direction of the endless belt 1, and the direction which intersects perpendicularly. Of course, the count thru/or period of this both-way migration is suitably made adjustable according to a cleaning effect. It may be slid at this time, making the washing brush 12 move slightly in the conveyance direction. Moreover, it is also possible to also make the direction of both-way migration into the direction of slanting to the conveyance direction of the endless belt 1. Moreover, although you may be unifying and it is not necessary to unify, since the washing brush 12 and the attraction nozzle 13 can attract efficiently the residual substance which the direction made to approach as much as possible raked out with the brush 12, they are desirable. It is [clearance / more advanced / penetrant remover] good in drawing by making the water absorption roll which equipped the cheesecloth and the absorber have in this direction of a lower stream of a river if needed furthermore.

[0037]

[Effect of the Invention] Since it was made to carry out attraction clearance of the residual substance attached to the support surface after record-medium exfoliation with the attraction means according to this invention as explained above, it is removable to quality of a residual solid, such as not only residual ink, a penetrant remover, etc. on this base material but a fluff, waste thread, dust, etc. Moreover, since it is an attraction means, it is rare to advance deterioration of the adhesive layer on a base material. Furthermore, since space-saving-izing is possible since small and miniaturization are possible, a cost side can also be made cheap and there is also no need for exchange not much, maintenance nature improves.

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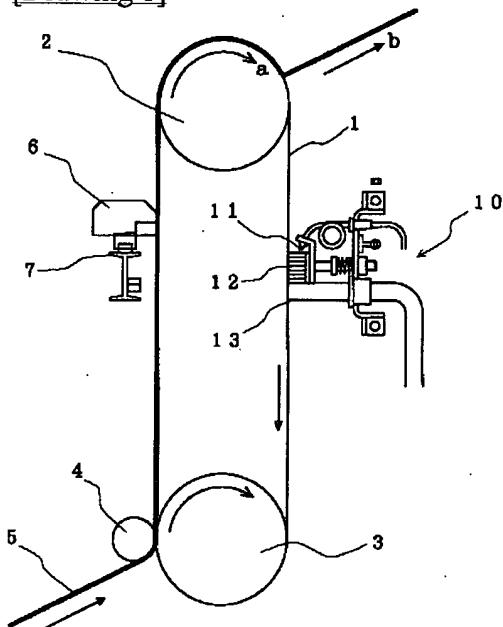
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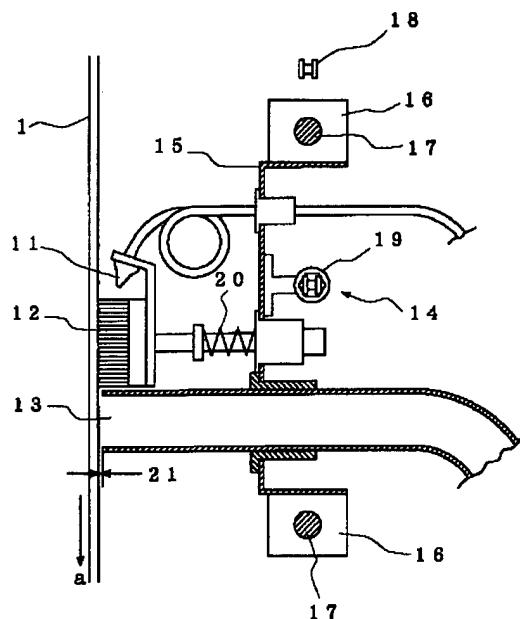
DRAWINGS

[Drawing 1]

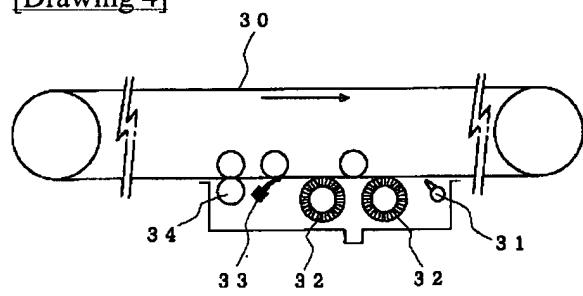


1 : 無端ベルト
 5 : 布帛
 6 : インクジェットヘッド
 10 : 洗浄装置
 11 : 洗浄液供給ノズル
 12 : 洗浄ブラシ
 13 : 吸引ノズル

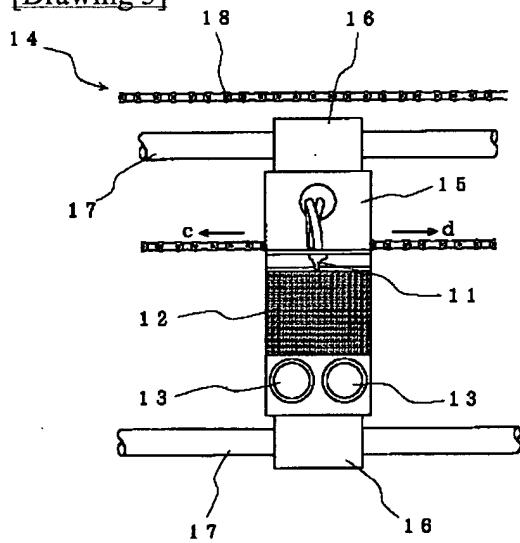
[Drawing 2]



[Drawing 4]



[Drawing 3]



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